

REMARKS

Claims 1-9, 11, 15, 20, 37, 39, 42, 45, 48, 63, 70, 77, 93-100, 103, 105, 106, and 113-116 have been canceled without prejudice. New claims 135 and 136 are added. Claims 10, 12-14, 16, 17-19, 21-36, 38, 40, 41, 43, 44, 46, 47, 49-62, 64-69, 71-76, 78-92, 101, 102, 104, 107-112, and 117-136 are currently pending.

Claim amendments

Claim 10 has been amended to insert an inadvertently omitted "and."

Claim 12 has been amended to recite that "R₁, R₃, R₄, and R₆, independently of one another, are selected from the group consisting of H, an alkyl group, an alkenyl group, an alkynyl group, and an aryl group, wherein any one of R₁, R₃, R₄, and R₆ are optionally substituted ..." The phrase "C1-8 alkyl" was removed as redundant over the second recitation of "alkyl" in the original claim. "H" was reinserted into the Markush Group as supported in claim 12 as filed. The term "group" was inserted after each of alkyl, alkenyl, alkynyl and aryl for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain." The claim now recites that "at least two of R₁, R₃, R₄, and R₆, are straight-chain, branched, or cyclic alkyl, alkynyl, alkenyl or aryl groups having from 8 to about 24 carbon atoms..." This amendment more specifically recites the length of at least two of the R₁, R₃, R₄, and R₆ groups. The amendment also corrects an error in grammar by replacing "a ... group" with "groups."

Claim 16 has been amended to recite "R₁, R₂, R₄ and R₅, independently of one another, are selected from the group consisting of H, an alkenyl group, an alkynyl group, and an aryl group, and an alkyl group optionally substituted ..." The phrase "C1-8 alkyl" was removed as redundant over the second recitation of "alkyl" in the original claim. The term "group" was inserted after each of alkyl, alkenyl, alkynyl and aryl for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain."

Claim 21 has been amended to recite " R₁ and R₄, independently of one another, are selected from the group consisting of H, -(CH₂)_p-D-Z, an alkyl group, an alkyl ether group, an alkenyl group, an aryl group, and an alkyl or alkyl ether group substituted by ..." in place of " R₁ and R₄, independently of one another, are selected from the group consisting of H, -(CH₂)_p-D-Z, an alkyl, an alkenyl group, an aryl, and an alkyl or alkyl ether optionally substituted by..." This amendment was made to remove redundancy because an alkyl group that is optionally substituted includes all alkyl groups. Claim 21 has also been amended to recite " R₂ and R₅, independently of one another, are selected from the group consisting of H, an alkenyl group, an alkynyl group, an aryl group, and an alkyl group optionally substituted ..." The phrase "C1-8 alkyl" was removed as redundant over the second recitation of "alkyl" in the original claim. The term "group" was inserted after each of alkyl, alkenyl, alkynyl, aryl and alkyl ether for improved clarity and for consistency with usage in other claims.

Claim 29 has been amended to recite "compound having the formula" which is consistent with the language used in other claims.

Claim 41 has been amended to recite "R₁ and R₄, independently of one another, are selected from the group consisting of H, -(CH₂)_p-D-Z, an alkyl group, an alkenyl group, an aryl group, an alkynyl group, and an alkyl ether group wherein any one of R₁ and R₄ are optionally substituted by ..." This amendment removes a second redundant recitation of "an alkyl". Claim 41 was also amended to recite "R₂ and R₅, independently of one another, are selected from the group consisting of H, an alkenyl group, an alkynyl group, an aryl group and an alkyl group optionally substituted ..." This amendment removes a redundant term "C1-8 alkyl." The term "group" was inserted after each of alkyl, alkenyl, alkynyl, and aryl for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain", an extraneous comma was removed and a grammatical error was corrected ("groups" was replaced with "group".)

Claim 46 has been amended to recite "R₂ and R₅, independently of one another, are selected from the group consisting of an alkenyl group, an aryl group, and an alkyl group optionally substituted ..." This amendment removes a redundant recitation of "C1-8 alkyl." The term "group" was inserted after each of alkyl, alkenyl, and aryl for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain", and an extraneous comma was removed

In claim 49 the phrase "straight chain, or branched, cyclic," was replaced with "straight-chain, branched, or cyclic". This is the correction of obvious typographic errors. The claim was further amended to recite "R₂ and R₅, independently of one another, are selected from the group consisting of an alkenyl group, an aryl group, and an alkyl group optionally substituted..." to remove a redundant recitation of "C1-8 alkyl." The term "group" was inserted after each of alkyl, alkenyl, and aryl for improved clarity and for consistency with usage in other claims.

Claim 55 was amended to recite " R₁ and R₄, independently of one another, are selected from the group consisting of H, -(CH₂)_p-D-Z, an alkyl group, an alkyl ether group, an alkenyl group, an aryl group, and an alkyl or alkyl ether group substituted by ..." to remove a redundant recitation of "an alkyl." An inadvertently omitted "and" was added. The claims was also amended to recite " R₂ and R₅, independently of one another, are selected from the group consisting of H, an alkenyl group, an aryl group, and an alkyl group optionally substituted by..." to remove a redundant recitation of "a C1-8 alkyl." The term "group" was inserted after each of alkyl, alkenyl, aryl and alkyl ether for improved clarity and for consistency with usage in other claims.

Claim 56 was amended to recite" R₂ and R₅, independently of one another, are selected from the group consisting of H, an alkenyl group, an aryl group, and an alkyl group optionally substituted by..." to remove a redundant recitation of "C1-8 alkyl." The term "group" was inserted after each of alkyl, alkenyl, and aryl for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain."

Claims 64, 71 and 78 have been amended to recite "R₂ and R₅, independently of one another, are selected from the group consisting of an alkenyl group, an aryl group, and an alkyl group optionally substituted..." to remove a redundant recitation of "C1-8 alkyl." The term "group" was inserted after each of alkyl, alkenyl, and aryl for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain."

Claim 85 has been amended to recite "R₁, R₃, R₄, and R₆, independently of one another, are selected from the group consisting of H, -(CH₂)_p-D-Z, an alkyl group, an alkenyl group, an aryl group, an alkynyl group, and an alkyl ether group wherein any one of R₁, R₃, R₄, and R₆ are optionally substituted..." to delete a redundant recitation of "an alkyl." The term "group" was inserted after each of alkyl, alkenyl, alkynyl, aryl and alkyl ether for improved clarity and for consistency with usage in other claims. The term "straight chain" was rewritten as "straight-chain."

Claims 86 and 90 have been amended to correct a typographic error. The term "straight chain" was rewritten as "straight-chain."

New claims 135-137 have been added. Both of these claims depend from and are supported by claim 12. The specific recitation of alkyl groups lengths of 14 and 16 is supported in the range of original claim 12 as well as in claim 111.

All of the amendments are fully supported by the application as filed including the original claims and schemes. None of the amendments to the claims represent the addition of new matter

The Rejections

Claims 10, 12-14, 16-19, 21-36, 38, 40-41, 43-44, 46-47, 49-62, 64-69, 71-76, 78-92, 101-102, 104, 107-109, 117-134 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 117-236 of

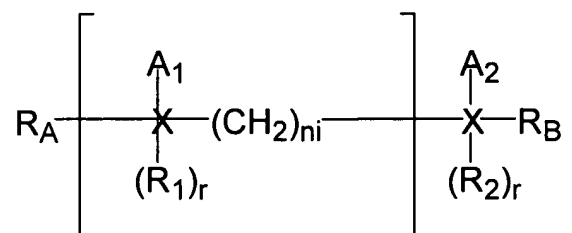
copending application USSN 10/629,522. The '522 application is commonly owned with the present application. The claims of the '522 application have not been patented. Applicants note that this provisional double patenting rejection is the only rejection remaining in this case with respect to all of the remaining claims except claim 12. It is believed that arguments presented herein will overcome the outstanding rejection of claim 12 and in this case "the examiner should then withdraw" the provisional double patenting rejection "and permit the application to issue as a patent." (See MPEP 804 1 (B)).

Applicants respectfully request withdrawal of the provisional double patenting rejection in this case.

Claim 12 is rejected under 35 U.S.C. 103 (a) as being unpatentable over a Haces et al. (U.S. patent No. 5,834,439). Applicants respectfully traverse this rejection.

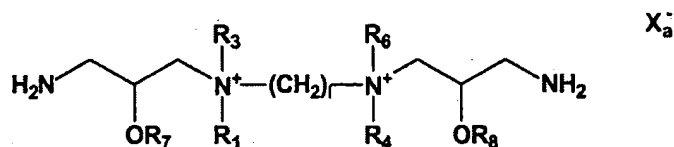
The rejection is explained as follows:

Haces et al. discloses polycationic compounds of the following formula (see col. 3, lines 50-57:



This formula specifically delineates wherein X may be selected from N (see col. 3, line 59), x = 1, and substituents A1-2 may be selected from Z3 which is a straight chain or branched alkyl group substituted with one or two OH, SH, NH₂ or amine groups within about 3 carbon atoms of the bond between Z3 (or A1-A2) and X (see col. 4, lines 17-20). This embodiment of Haces et al. clearly

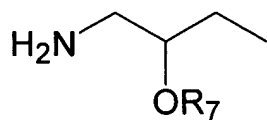
suggests the design of compounds of according to claim 12 which discloses compounds of the following formula, **particularly wherein there is a straight chain alkyl of 3 carbons substituted with an OH and an NH2** (emphasis added).



The compounds represented by the formula recited in claim 12 represent an obvious variation of a preferred embodiment of the compounds of Haces et al. (emphasis added) at the time the invention was made.

Applicants respectfully traverse this rejection.

Claim 12 is directed to a compound of the formula listed immediately above wherein at least two of R_1 , R_3 , R_4 , and R_6 , are straight-chain, branched, or cyclic alkyl, alkynyl, alkenyl or aryl groups having from 8 to about 24 carbon atoms attached to each N. The remaining two of R_1 , R_3 , R_4 , and R_6 can be H, an alkenyl group, an alkynyl group, and an aryl group, wherein any one of R_1 , R_3 , R_4 , and R_6 are optionally substituted by one or more of an alcohol, an amine, an amide, an ether, a polyether, a polyamide, an ester, a mercaptan, a urea, a thiourea, a guanidyl, or a carbamoyl group. Importantly, the two nitrogens of the molecule are substituted with a rather specific amino alcohol group:



where R_7 is H or a carbohydrate.

With respect to Haces et al. there is no teaching or suggestion of the specific amino alcohol of claim 12 in any descriptions of the A₁, A₂, R_A, R_B, R₁ or R₂ groups. Under the various definitions of A₁ and A₂ groups, as emphasized by the Examiner, is group Z₃ -"a straight-chain or branched alkyl group substituted with one or two OH, SH, NH₂ or amine groups within about 3 carbon atoms of the bond between Z₃ and X." This description, however, does not limit the length of the Z₃ group to 3 carbons. It is noted in Haces et al. at col. 6, lines 35-39 that "A₁ and A₂ groups having 2-22 carbon atoms" are of particular interest. Additional preferred embodiments of A₁ and A₂ are described (col. 8, 27-31) as 12-16 carbon atoms and 16 carbon atoms. The Haces et al. description thus teaches away from short A₁ and A₂ groups and teaches away from the propyl amino alcohol group substituent of claim 12. Thus, there is no specific teaching or suggestion in Haces et al. that a Z₃ group having 3 carbon atoms is a preferred embodiment.

At col. 5, lines 20-32, Haces et al. teach that OH, NH₂, and amine groups within about 3 carbon atoms of the bond between Z and X facilitate solubility of the compounds of that invention. However, there are many ways that two OH, NH₂ or amine groups can be substituted on a straight-chain or branched alkyl group even if the substitution is specified to be with the first three carbons of the group. The specific positioning of one OH (at carbon 2) and one NH₂ (at carbon 3) as recited in the propyl amino alcohol group structure of claim 12 is nowhere taught or suggested by Haces et al.

In addition to the variable definitions listed by the Office Action, the Haces et al. patent also defines n_i, R_A, R_B, R₁ and R₂. Even if it were assumed, for the sake of argument, that the propyl amino alcohol group substituent of claim 12 were taught or suggested by Haces et al., this reference does not teach or suggest the combination of substituents recited in claim 12. In Haces et al. R_A, and R_B can be hydrogen, or an alkyl, hydroxyl alkyl or thiol substituted alkyl having **1 to 6 carbon atoms**, while R₁ and R₂, if present, can be alkyl groups having **1 to 6 carbon atoms**. As noted above,

claim 12 recites that at least two of the R_1 , R_3 , R_4 , and R_6 substituents, one on each N, have 8 to about 24 carbon atoms. Haces et al. does not teach or suggest that any of the R_A , R_B , R_1 and R_2 can have 8 to about 24 carbon atoms. In general, Haces et al. teaches and suggests longer chain A_1 and A_2 groups (i.e., Z_3 groups) preferably having 12-16 carbon atoms and shorter chain R_A , R_B , R_1 and R_2 groups.

Thus, Haces et al. does not specifically teach and does not suggest a substituent that is "a straight chain alkyl of 3 carbons substituted with an OH and an NH_2 " as stated in the Office Action. Haces et al. generally teaches that preferred A_1 and A_2 substituents are significantly longer than 3 carbon atoms. Furthermore, Haces et al. teaches that R_A , R_B , R_1 and R_2 substituents are less than 6 carbons in length and makes no suggestion that longer chain substituents would function in the invention. No preferred embodiment of Haces et al. has the combination of substituents that are recited in claim 12. The preferred embodiments of Haces et al. in fact teach away from the combination of substituents in claim 12.

The compounds claimed in claim 12 cannot in fact be obtained by any selection of variables as described by Haces et al. While in Haces et al. X can most generally be chosen to be N, x can most generally be chosen to be 1, n_i can most generally be chosen to be 1-4 and most generally Z_3 can be any straight-chain or branched alkyl having one or two OH, SH, NH_2 or amine groups substituted within three carbons of the bond to X, none of R_A , R_B , R_1 or R_2 can be chosen to be straight-chain, branched, or cyclic alkyl, alkynyl, alkenyl or aryl groups having from 8 to about 24 carbon atoms attached to each N as is recited in claim 12. Furthermore, there is no teaching or suggestion in Haces et al. to even make the combination of choices for X, x, n_i , and Z_3 that are listed above. The selections listed above can be made only in hindsight in view of the compounds claimed in claim 12 by Applicants. It is not permissible to use such hindsight reconstruction in a rejection under section 103. In a proper rejection, the prior art must be shown to provide the teaching or suggestions to make the combination proposed. This has not been done and the rejection does not make a case of prima facie obviousness of claim 12.

New claims 135-137 depend from claim 12 and in view of the forgoing should be considered allowable over the cited art. Furthermore, claim 136 recites that "at least two of R₁, R₃, R₄, and R₆, are straight-chain alkyl groups having from 14 or 16 carbon atoms attached to each N." Analogous to arguments presented above, Haces et al. does not teach or suggest a compound having the combination of substituents claimed in claim 136. None of R_A, R_B, R₁ or R₂ of Haces et al. can be alkyl groups having 14 or 16 carbon atoms.

In view of all the foregoing, no prima facie case of obviousness has been made in the rejection and the rejection of claim 12 should be withdrawn. Claim 12 should be considered to be patentable over the cited reference because Haces et al. does not teach or suggest the specific propyl amino alcohol group of claim 12 and does not teach or suggest the combination of substituents on the nitrogens of claim 12. New claims 135 and 136 depend from claim 12 and should likewise be considered allowable.

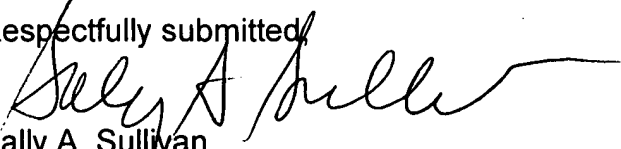
Allowable claims

Claims 111 and 112 are allowed. As noted above, only claim 12 has been subject to a rejection that is not a provisional double patenting rejection. In view of the forgoing argument, we submit that the remaining rejection of claim 12 should be withdrawn and all of the claims remaining in this case should be considered allowable.

CONCLUSION

It is believed that claims fees for three dependent claims in excess of 20 are due. This response is accompanied by a Petition for Extension of Time of Three Months with appropriate fees. If the fees submitted are incorrect, please deduct any deficiency or credit any overpayment to deposit account no. 07-1969.

Respectfully submitted,


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